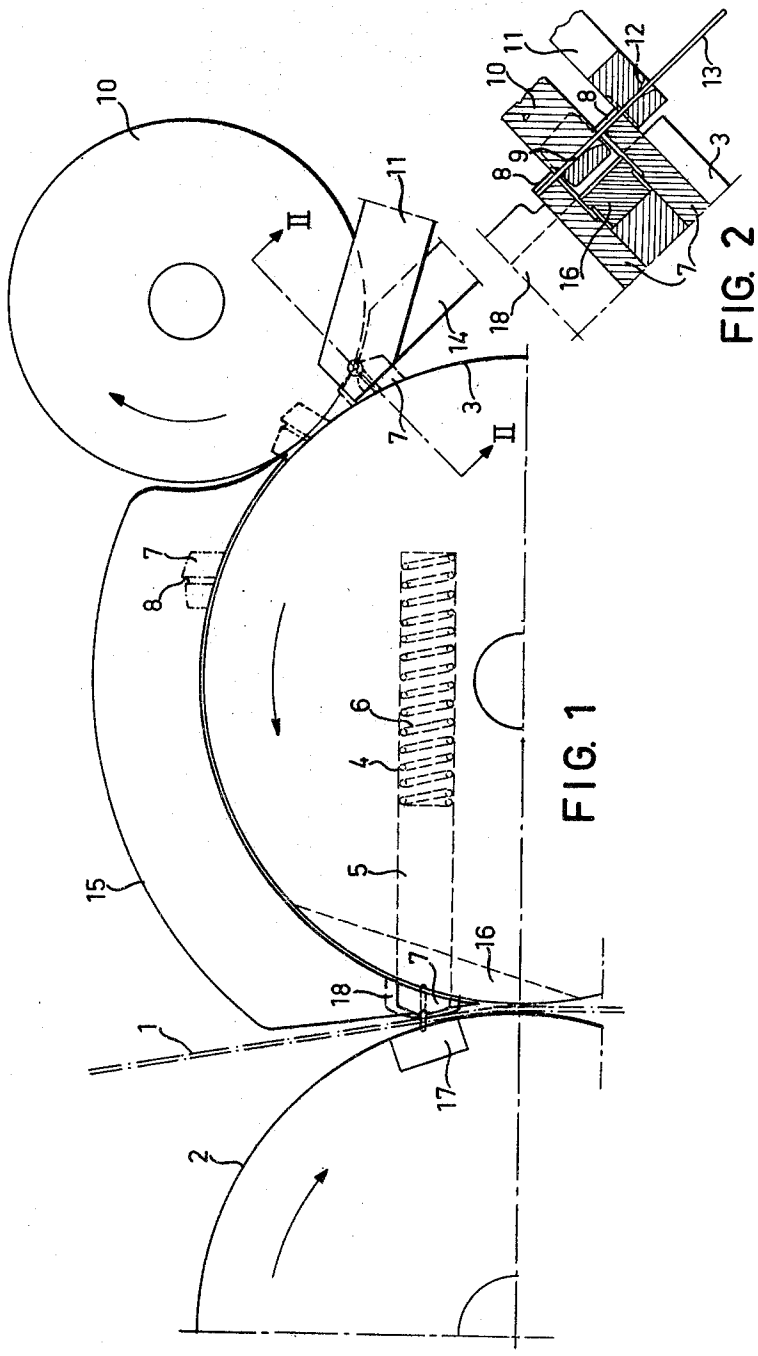
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DEVICE FOR STAPLING OF ENDLESS PAPER WEB OR SIMILAR MATERIAL

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DEVICE FOR STAPLING OF ENDLESS PAPER WEB OR SIMILAR MATERIAL

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ABSTRACT OF THE DISCLOSURE

A device for stapling of an endless paper web or similar material running continuously between for example a receiving roll and an adjacent stapling roll, having the same directional movement, by way of a stapling device, located in the stapling roll. The stapling device carries a ready cut staple and brings the same to be stitched through the paper web against the receiving roll, whereby the stapling device is arranged to receive a staple blank, cut off by a cutting device from a wire supply, and to carry said staple blank past a staple bending unit, located outside of the stapling roll. The wire cutting device comprises two cooperating cutting members, one of which is mounted on and rotates together with the stapling roll, and the other one comprising a cutting member, located in fixed position outside of the stapling roll.

The present invention relates to a device for stapling of an endless paper web or similar material, running continuously between for example a receiving roll and an adjacent stapling roll, having the same directional movement, by way of a stapling device, located in the stapling roll, which stapling device carries a ready cut staple, bringing the same to be stitched through the paper web against receiving roll, whereby the stapling device is arranged to receive a staple blank, cut off by a cutting device from a wire supply, and to carry said staple blank past a staple bending unit, located outside of the stapling roll. The object of this invention is to provide a stapling device capable of working at a considerably higher operational speed than known staplers of the prior art. This object is achieved by the wire cutting device comprising two cooperating cutting members one of which is mounted on and rotates together with the stapling roll, and the other one comprising a cutting member, is located in fixed position outside of the stapling roll.

An embodiment of the invention will now be described below with reference to the accompanying drawing, in which:

FIG. 1 is a schematic view of the device as seen in axial direction, and

FIG. 2 is a cross sectional partial view along line II—II in FIG. 1.

The endless paper web **1** to be stapled is conveyed downwards between receiving roll **2** and adjacent stapling roll **3**, rotating in the same direction. Stapling roll **3** is provided with a staple shaping stitching device **5** located in guiding duct **4** extending in chordwise direction, said device being longitudinally displaceable, biased by spring **6**. Two legs **7** of the forkshaped stapling device project a small distance outside the periphery of stapling roll **3**, said legs being provided with grooves **8** in their end surfaces to receive staple blank **9**. At an angular distance of approximately 140° from receiving roll **2** in opposite direction to the rotating movement there is provided a pulley **10** cooperating with stapling device **5**, which pulley is adjacently located to and running in the same direction as stapling roll **3**. Said stapling roll **3**, which may suitably

have a diameter of 180 mm., is arranged to rotate at a speed, i.e. at an r.p.m., which is 1.8 times greater than the speed of pulley **10**, the diameter of which may suitably be 100 mm. and its width may be of a dimension to permit said pulley to freely rotate between the legs **7** of the fork shaped staple device. The wire bending pulley **10** which, as seen in FIG. 2 has a smooth periphery, and a smooth circumference, has a peripheral speed which is lower than that of the stapling roll **3**. Located in fixed position at a further distance along the periphery of staple roll **3**, there is a wire feed arrangement comprising a guiding member **11**, provided with guide hole **12**, for stitching wire **13**. A fixed support **14** for the wire is positioned below pulley **10** to engage and stabilize the wire during the cutting operation. The wire feed device is arranged to supply predetermined lengths of stitching wire, each length corresponding the material required to form a complete staple, the feeding being synchronized with the stapling operation in conventional manner. Once a piece of wire has been advanced and staple mechanism **5** of the stapling roll is moved forward towards the wire, the latter is received in grooves **8** of legs **7** of the stapling mechanism, being cut off at the point of exit from wire guiding hole **12** by shear action between the faces of leg **7** and guide member **11**. The cutting off point is located adjacent or close to the first point of contact of the staple material with the periphery of pulley **10**. Thus, the cutting off operation of the wire takes place approximately simultaneously with the initiation of the bending operation of the staple material, thereby eliminating any movement of the staple material, before it is clamped between pulley **10** and the legs of the stapling mechanism. During the continued movement of staple mechanism **5** together with the stapling roll, pulley **10** is introduced between legs **7** of the staple mechanism, bending the wire to staple shape. When the stapling mechanism leaves the pulley the legs pass a guide bar **15**, located in fixed position between the pulley and the stapling mechanism and following the curvature of the stapling roll, said guide bar preventing the staple to be thrown out by centrifugal force. When staple mechanism **5** approaches receiving roll **2**, it is pushed by roll **2** in an inward direction in its guiding duct **4**, so that the staple will be liberated and be ready to penetrate the paper web being clinched between hammer **16** of the stapling roll and anvil **17** of the receiving roll. At the side of stapling mechanism **5** a rabbet **18**, adapted to resiliently engage legs **7**, may be arranged to displace said legs in order to reduce wear and prevent paper web damage.

What I claim is:

1. In a device for stapling an endless web of paper or similar material, the combination comprising a receiving roll, a stapling roll, said rolls being mounted for rotation in opposite directions with their peripheries adjacent each other and between which the endless web is fed, a stapling mechanism located on said stapling roll and which functions to bring a ready cut staple to and be stitched through the web against the periphery of said receiving roll, said stapling mechanism comprising a pair of parallel spaced legs projecting exteriorly of the periphery of said stapling roll and which are arranged to be pressed inwardly into said roll, a wire feed device synchronized with rotation of said stapling roll and which supplies predetermined lengths of stitching wire each of which is convertible into a staple, the outer ends of said parellel spaced legs of said stapling mechanism including aligned grooves which receive one of said predetermined lengths of stitching wire as said stapling roll is rotated past said wire feed device and effect a cut off of said length by shear action between a face on one of said legs and an adjoining face on said wire feed device, a fixed support engaging and stabilizing said length of stitching

wire during the cut-off operation, and a staple bending pulley mounted for rotation in a direction opposite to that of said stapling roll, said staple bending pulley having a peripheral speed lower than that of said stapling roll, a smooth periphery positioned adjacent the periphery of said stapling roll and a width slightly less than the distance between said legs of said stapling mechanism, and said staple bending pulley being so located as to first engage the length of stitching wire held in said grooves of said legs at substantially the cut off point and thereafter progressively bend the length of stitching wire into staple form as the full width of the periphery of said bending pulley extends progressively deeper into the space between said outwardly projecting legs upon rotation of said stapling roll.

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